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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,059	04/12/2005	Luis Carlos Maradini	MARADINI, L. - 1 PCT	4564
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COLLARD & ROE, P.C. 1077 NORTHERN BOULEVARD ROSLYN, NY 11576			EXAMINER HUDA, SAEED M	
			ART UNIT 1791	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/531,059	Applicant(s) MARADINI, LUIS CARLOS	
	Examiner SAEED M. HUDA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/12/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/27/2005 and 12/20/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Phrasing in claim set is cumbersome and confusing. Applicant should present claims such that they conform to U.S. claim drafting practice.
2. Use of quotations is improper in a claim set. Correction is required.
3. The use of the word “called” is not proper in claim language and should be eliminated. Correction is required.
4. The word “grinded” should be replaced with “ground” in claim 4 and anywhere else it is used; “Grinded” is improper English. Correction is required.
5. With regards to claim 5, “de end” should be changed to “the end”. Correction is required.
6. Underlining in the original claims should be eliminated – this type of designation is generally used in amended claims to denote changes.
7. Numbering of claims should only use numerals rather than the presently used 1st, 2nd, etc. Correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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- a. It is unclear what "ABS" means. Though used throughout application, "ABS" is never defined. For examination purpose the examiner interprets ABS to be an acronym that stands for acrylonitrile butadiene styrene.
- b. It is unclear what applicant intended by the phrase "presenting a first level logic". For examination purposes, The Examiner interprets the phrase to mean any general logic.
- c. It is unclear what applicant intended by the steps listed in claim 1. For examination purposes, The Examiner interprets these steps to mean the following:
 - i. Receiving raw material – any process that involves the receiving of raw materials
 - ii. Storage of raw material – any process that involves the storage of raw materials
 - iii. Pre-polymerization – any process that involves pre-polymerization
 - iv. Polymerization - any process that involves polymerization
 - v. Second polymerization - any process that involves second polymerization
 - vi. Inspection - any process that involves inspection
 - vii. Plate packing - any process that involves plate packing
- d. With regards to claim 2, it is unclear how the phrase "a step called addition of other agents" limits the claim. Correction is required.
- e. With regards to claim 3, it is unclear what is meant by the phrase "characterized by the stage...final water temperature = $120.0 \pm 1.0^{\circ}\text{C}$."

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- f. With regards to claims 3 and 5, it is particularly unclear what the phrase "Ford cup 4° viscosity = 100/110 sec" means. Applicant does not provide a definition for "Ford cup".
- g. With regards to claim 6, it is unclear what is intended by the phrase "respecting a thermal curve". Clarification is needed. For examination purposed, The Examiner interprets this phrase to me "representing a thermal curve". Additionally, the time frame involved in the steps of heating and cooling is unclear. For examination purposes, The Examiner interprets the steps as follows: *the mold is brought to an initial temperature of 50°C and held at this temperature for one hour after which the temperature is increased to 120°C. This temperature is maintained constant until for four hours at which point, the mold and the polymerized plates inside the mold are cooled.*
- h. With regards to claim 7, the use of the word "low" to describe the temperature and pressure at which the mould is filled is unclear.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Visser (EP 1734828 A1).

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- a. With regards to claim 1, Visser discloses a process for producing a thermoformable acrylic resin sheet having a granite-like appearance after thermoforming (page 1 lines 57-60). Visser discloses a process where ground particles of methyl methacrylate (MMA) are used (page 2 lines 13-14); in order to do this, these particles must be received (receiving raw material). Though not explicitly disclosed that the raw material were stored such would naturally flow from the fact that after receiving the product, any particles unused particles or particles that will be used in the future must be stored. A first prepolymer is prepared by partly polymerizing MMA in the presence of a small amount of a polymerization initiator (page 2 lines 44-45). Colored ground particles of MMA resin are incorporated in a colored liquid MMA matrix resin composition and the mixture is polymerized (page 2 lines 8-11). To produce the thermoformable acrylic resin sheet, a prepolymer, which has been prepared according to the polymerization method mentioned above, is used and the additional amount of polymerization initiator needed for further polymerization is added (page 4 lines 14-16) (second polymerization). Visser does not disclose a process of inspection and plate packing; however, both of these are well know manufacturing related processed. Inspection is performed in all manufacturing environments to ensure that the high quality products are produced. Plate packing is performed after plates have been produced and is done in anticipation of producing shipment.
- b. With regards to claim 2, Visser discloses that colored ground particles of MMA is placed in a reaction vessel (reactor type equipment) with other agents

and that the temperature of the vessel is maintained at temperature of 85°C-95°C (page 5 lines 5-21). Visser, however, is silent with regards to how the MMA is introduced to the vessel. It is well known when dealing with reactor type equipment or reaction vessel that the most efficient, effective, and safe method to introduced product into these structures is through a pumping process.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visser (EP 1734828 A1) as applied to claim 1 above, and further in view of Hasskerl et al. (PCT/EP03/01788) and Matsumaru et al. (US 4830803).

Visser discloses the use of raw MMA (page 2 lines 13-14) and a catalyst (initiators) are used in the polymerization process (page 2 lines 51-57) the addition of said initiators will provide chemical resistance to solvents. Visser also states that fatty acids and fatty acid esters such as stearic acid and dioctyl sodium sulfosuccinate can be used as release (demoulding) agents (page 2 lines 58-59). Hasskerl et al. disclose a polymerisable composition where a reactant mixture comprising solution (A) containing methyl methacrylate, glycidyl methacrylate, azobis-(isobutyronitrile) (0.03), and azobis-(2,4-dimethyl valeronitrile) was stirred for 1 hour until homogeneous (solution B). The two solutions were polymerized in a polymerization unit comprising two 6-8 mm outer

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glass plates with a thin 0.4-1.0 mm silicate glass plate on the inside of each glass plate, and a PVC sealing cord between the plates, and the assembly was polymerized. It would have been obvious to one skilled in the art at the time of the invention to use the PVC cord of Hasskerl et al. in the modified invention of Visser because this cord assist in the process of making an acrylic glass laminate. Visser discloses that the mixture is polymerized in a water bath at 70°C and then in an air oven at 120°C for a longer time at this temperature (page 4 lines 2-6). Visser fails to disclose the times used in the heating process. However, absent evidence of unexpected results obtained from heating for the claimed time period, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a suitable time period to effectively heat the material, the time period being a result effective variable routinely optimized by those of skill in the art. The optimization of a range or other variable within the claims that flows from the “normal desire of scientists or artisans to improve upon what is already generally known” is prima facie obvious. *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (determining where in a disclosed set of percentage ranges the optimum combination of percentages lies is prima facie obvious). The discovery of an optimum value of a variable in a known process is usually obvious. *In re Aller*, 220 F.2d 454, 456 (C.C.P.A. 1955). See also *In re Boesch*, 617 F.2d 272, 276 (C.C.P.A. 1980) (“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”). See also *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (“[I]t is not inventive to discover the optimum or workable ranges by routine experimentation.” (quoting *Aller*, 220 F.2d at 456)); *In re Kulling*, 897 F.2d 1147, 1149

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(Fed. Cir. 1990) (finding no clear error in Board of Patent Appeals and Interferences' conclusion that the amount of eluent to be used in a washing sequence was a matter of routine optimization known in the pertinent prior art and therefore obvious). It would have been obvious to one skilled in the art at the time of the invention to replace the 120°C air oven process with a 120°C water bath process because all that would be needed is to increase the first water bath temperature from 70°C to 120°C (i.e. no sample removal would be required). Matsumaru et al. disclose that a mixture is prepared by dissolving 0.04 g of cumylperoxy neodecanoate and 2 g of di-t-butyl peroxide each per kg in 80 parts by weight of methyl methacrylate containing 4% by weight of polymethyl methacrylate having an average polymerization degree of about 12,000 and 20 parts by weight of 2,2-dimethylol propane dimethacrylate was poured into the same cell as used in Example 4 and then polymerized in a constant temperature water bath at 50°C (column 3 lines 1-20). It would have been obvious to one skilled in the art at the time of the invention to use this temperature in the invention of Visser because it is an art recognized temperature used to complete the process of polymerization, as exemplified by the teaching of Matsumaru et al. (column 13 lines 26-35). Though there is no explicit disclosure that the plates and mold are cooled while the plates are inside the mold, such would naturally flow from the fact that if the plates were removed prior to the mold cooling, the plates could see undesirable warpage due to cooling shrinkage. Additionally, a thermal curve of this data could be generated.

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14. Claims 4, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visser (EP 1734828 A1) as applied to claim 1 above, and further in view of Shimoyama et al. (US 2002/0006521 A1).

- a. With regards to claim 4, Visser discloses a process of polymerization (page 2 lines 44-45) where particles are selected (page 2 lines 13-14). This process utilizes a mold and in order for this to occur, a mold must first be prepared and then a mixture of resin particles and matrix resin is brought into the flat mold (i.e. flat mold is filled) (page 2 line 1-6). Visser states that the sample is heated up and that after polymerization that the sheet is cooled (page 4 lines 1-5). Visser does not make any explicit disclosure that the plate is demolded; however, such would naturally flow from the fact that any subsequent procedures performed on the plate would have to be done once the plate was demolded to prevent the mold from becoming damaged. Visser goes on to state that after polymerization, the sheet is cooled and is cut or broken into small pieces which are further crushed or ground (page 4 lines 4-6). Visser does not disclose the use of an autoclave.

Shimoyama et al. disclose that an MMA mixture is formed and that the resulting mixture is degassed in an argon atmosphere (to remove bubbles that can create porosity) and the mixture was then put in an autoclave. It would have been obvious to one skilled in the art at the time of the invention to use the autoclave of Shimoyama et al. in the process of Visser because an autoclave can assist in making a more uniform, homogenous product.

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- b. With regards to claim 7, Visser discloses that the mold must be coated with demolding agent (i.e. mold preparation) (page 2 lines 58-59) and that the molds are filled (page 2 line 1-6) with cross-linking monomer (additive that allows for cross linking), chain transfer agent, and comonomer (page 3 lines 6-10) (second formulation). The temperatures at which this occurs is not indicated to be elevated or depressed and is thus interpreted as being performed at room temperatures and atmospheric pressure (relatively low temperatures and pressures compared to the elevated temperatures and pressures seen later in the process). Visser discloses a polymerization process (page 2 lines 8-11). Though a demolding step is not explicitly disclosed, such would naturally flow from the fact that a demolding agent is applied to the mold (i.e. an agent that will make the process of removing the sample from the mold easier). Visser does not make explicit disclosure with regards to degassing or the use of an autoclave. The discussion of degassing and the use of an autoclave is found in the rejection for claim 4 and is incorporated herein.
- c. With regards to claim 8, Visser makes no disclosure with regards to using ABS. Discussion of the PVC cord and temperatures can be found in the rejection for claim 3 and are incorporated herein. Visser makes no explicit disclosure that the mold is washed or the mold is closed. It would have been obvious to one skilled in the art at the time of the invention to wash the mold to remove any contamination that could be introduced into the molded part

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resulting in decreased quality. Additionally, closing the mold would naturally flow from the fact that the molding process could not be completed if the mold were left open and that the closed mold would better constrain the part.

15. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visser (EP 1734828 A1) in view of Shimoyama et al. (US 2002/0006521 A1) as applied to claim 1 above, and further in view of Brehm et al. (US 5700576).

- a. With regards to claim 5, Visser discloses the use of MMA (page 2 lines 13-14) and the use of an initiator (catalyst) in an amount sufficient to complete the polymerization process (page 3 lines 3-5). Additionally added are a polyfunctional cross-linking monomer (additive that allows for cross linking), chain transfer agent, and comonomer (page 3 lines 6-10). Though not explicitly disclosed, one or more of these additive are chemically resistant to solvents. The chain transfer agent controls and shortens the chain length at the polymerization stage and thereby improves the flexibility when the resin sheet is thermoformed (additive to increase moldability and elasticity) (page 3 lines 8-10). Discussion of the PVC cord and temperatures can be found in the rejection for claim 3 and are incorporated herein. Visser, however, is silent with regards to the use of an ABS plate. Brehm et al. disclose that a molded article made of ABS and where plates or structure are comprised of MMA (column 6 lines 33-46). It would have been obvious to one skilled in the art at the time of the invention to use the ABS of Brehm et al. in the invention of

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Visser because ABS is a light, rigid, molded product and can thus impart strength without negatively imparting excess weight.

- b. With regards to claim 9, Visser does not explicitly disclose the use of ABS.

The use of PVC is discussed in the rejection for claim 5 above. Visser makes no explicit disclosure that the mold is washed or the mold is closed. It would have been obvious to one skilled in the art at the time of the invention to wash the mold to remove any contamination that could be introduced into the molded part resulting in decreased quality. Additionally, closing the mold would naturally flow from the fact that the molding process could not be completed if the mold were left open and that the closed mold would better constrain the part.

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Visser (EP 1734828 A1) in view of Shimoyama et al. (US 2002/0006521 A1) as applied to claim 7 above, and further in view of JP 08134224 A.

Visser, in the rejection for claim 3, discloses the increase in temperature from 50°C-120°C, but fails to disclose increasing to an intermediate temperature of 80°C. JP 08134224 A discloses MMA combined with other materials and an emulsifying agent and polymerization initiator and polymerized at 70°C-80°C. It would have been obvious to one skilled in the art at the time of the invention to use this polymerization temperature in the process of Visser because this is an art recognized temperature that polymerization of MMA occurs, as exemplified by the teaching of JP 08134224 A. The

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rejection for claim 6 contains discussion related to polymerization times. The logic and reasoning presented in that claims is incorporated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAEED M. HUDA whose telephone number is (571)270-5514. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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